

Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) (Recast) (Text with EEA relevance)

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ANNEX VII

Technical provisions relating to installations and activities using organic solvents

PART 1

Activities

1. In each of the following points, the activity includes the cleaning of the equipment but not the cleaning of products unless specified otherwise.

2. Adhesive coating

Any activity in which an adhesive is applied to a surface, with the exception of adhesive coating and laminating associated with printing activities.

3. Coating activity

Any activity in which a single or multiple application of a continuous film of a coating is applied to:

(a) either of the following vehicles:

(i) new cars, defined as vehicles of category M1 in Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles⁽¹⁾ and of category N1 in so far as they are coated at the same installation as M1 vehicles;

(ii) truck cabins, defined as the housing for the driver, and all integrated housing for the technical equipment, of vehicles of categories N2 and N3 in Directive 2007/46/EC;

(iii) vans and trucks, defined as vehicles of categories N1, N2 and N3 in Directive 2007/46/EC, but not including truck cabins;

(iv) buses, defined as vehicles of categories M2 and M3 in Directive 2007/46/EC;

(v) trailers, defined in categories O1, O2, O3 and O4 in Directive 2007/46/EC;

(b) metallic and plastic surfaces including surfaces of airplanes, ships, trains, etc.;

(c) wooden surfaces;

(d) textile, fabric, film and paper surfaces;

(e) leather.

Coating activities do not include the coating of substrate with metals by electrophoretic and chemical spraying techniques. If the coating activity includes a step in which the same article is printed by whatever technique used, that printing step is considered part of the coating activity. However, printing activities operated as a separate activity are not included, but may be covered by Chapter V of this Directive if the printing activity falls within the scope thereof.

4. Coil coating

Any activity where coiled steel, stainless steel, coated steel, copper alloys or aluminium strip is coated with either a film forming or laminate coating in a continuous process.

5. Dry cleaning

Any industrial or commercial activity using volatile organic compounds in an installation to clean garments, furnishing and similar consumer goods with the exception of the manual removal of stains and spots in the textile and clothing industry.

6. Footwear manufacture

Any activity of producing complete footwear or parts thereof.

7. Manufacturing of coating mixtures, varnishes, inks and adhesives

The manufacture of the above final products, and of intermediates where carried out at the same site, by mixing of pigments, resins and adhesive materials with organic solvent or other carrier, including dispersion and predispersion activities, viscosity and tint adjustments and operations for filling the final product into its container.

8. Manufacturing of pharmaceutical products

The chemical synthesis, fermentation, extraction, formulation and finishing of pharmaceutical products and, where carried out at the same site, the manufacture of intermediate products.

9. Printing

Any reproduction activity of text and/or images in which, with the use of an image carrier, ink is transferred onto whatever type of surface. It includes associated varnishing, coating and laminating techniques. However, only the following sub-processes are subject to Chapter V:

- (a) flexography – a printing activity using an image carrier of rubber or elastic photopolymers on which the printing areas are above the non-printing areas, using liquid inks which dry through evaporation;
- (b) heatset web offset – a web-fed printing activity using an image carrier in which the printing and non-printing area are in the same plane, where web-fed means that the material to be printed is fed to the machine from a reel as distinct from separate sheets. The non-printing area is treated to attract water and thus reject ink. The printing area is treated to receive and transmit ink to the surface to be printed. Evaporation takes place in an oven where hot air is used to heat the printed material;
- (c) laminating associated to a printing activity – the adhering together of two or more flexible materials to produce laminates;
- (d) publication rotogravure – a rotogravure printing activity used for printing paper for magazines, brochures, catalogues or similar products, using toluene-based inks;
- (e) rotogravure – a printing activity using a cylindrical image carrier in which the printing area is below the non-printing area, using liquid inks which dry through evaporation. The recesses are filled with ink and the surplus is cleaned off the non-printing area before the surface to be printed contacts the cylinder and lifts the ink from the recesses;
- (f) rotary screen printing – a web-fed printing activity in which the ink is passed onto the surface to be printed by forcing it through a porous image carrier, in which the printing area is open and the non-printing area is sealed off, using liquid inks which dry only through evaporation. Web-fed means that the material to be printed is fed into the machine from a reel as distinct from separate sheets;

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- (g) varnishing – an activity by which a varnish or an adhesive coating for the purpose of later sealing the packaging material is applied to a flexible material.

10. Rubber conversion

Any activity of mixing, milling, blending, calendering, extrusion and vulcanisation of natural or synthetic rubber and any ancillary operations for converting natural or synthetic rubber into a finished product.

11. Surface cleaning

Any activity except dry cleaning using organic solvents to remove contamination from the surface of material including degreasing. A cleaning activity consisting of more than one step before or after any other activity shall be considered as one surface cleaning activity. This activity does not refer to the cleaning of the equipment but to the cleaning of the surface of products.

12. Vegetable oil and animal fat extraction and vegetable oil refining activities

Any activity to extract vegetable oil from seeds and other vegetable matter, the processing of dry residues to produce animal feed, the purification of fats and vegetable oils derived from seeds, vegetable matter and/or animal matter.

13. Vehicle refinishing

Any industrial or commercial coating activity and associated degreasing activities performing either of the following:

- (a) the original coating of road vehicles as defined in Directive 2007/46/EC or part of them with refinishing-type materials, where this is carried out away from the original manufacturing line;
- (b) the coating of trailers (including semi-trailers) (category O in Directive 2007/46/EC).

14. Winding wire coating

Any coating activity of metallic conductors used for winding the coils in transformers and motors, etc.

15. Wood impregnation

Any activity giving a loading of preservative in timber.

16. Wood and plastic lamination

Any activity to adhere together wood and/or plastic to produce laminated products.

PART 2

Thresholds and emission limit values

The emission limit values in waste gases shall be calculated at a temperature of 273,15 K, and a pressure of 101,3 kPa.

| Activity | SO ₂ threshold values | NO _x threshold values | Fugitive emission limit values | Total emission limit values | Special provisions |
|-------------|----------------------------------|----------------------------------|--------------------------------|-----------------------------|--------------------|
| consumption | consumption | limit | limit values | | |
| threshold | threshold | values | limit values | | |

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| | in tonnes/year) | in tonnes/year) | in waste gases (mg C/Nm ³) | (percentage of solvent input) | | New installations | Existing installations | |
|---|--|------------------------------------|--|--|------------------------|-------------------|------------------------|---|
| | | | | New installations | Existing installations | | | |
| 1 | Heatset web offset printing (> 15) | 15—25 > 25 | 100 20 | 30 ⁽¹⁾ 30 ⁽¹⁾ | | | | ⁽¹⁾ Solvent residue in finished product is not to be considered as part of fugitive emissions. |
| 2 | Publication rotogravure (> 25) | | 75 | 10 | 15 | | | |
| 3 | Other rotogravure, flexography, rotary screen printing, laminating or varnishing units (> 15) rotary screen printing on textile/cardboard (> 30) | 15—25 > 25 30 ⁽¹⁾ | 100 100 100 | 25 20 20 | | | | ⁽¹⁾ Threshold for rotary screen printing on textile and on cardboard. |
| 4 | Surface cleaning using compounds specified in Article 59(5). (> 1) | 1—5 > 5 | 20 ⁽¹⁾ 20 ⁽¹⁾ | 15 10 | | | | ⁽¹⁾ Limit value refers to mass of compounds in mg/Nm ³ , and not to total carbon. |

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| 5 | Other surface cleaning (> 2) | 2—10 > 10 | 75 ⁽¹⁾ 75 ⁽¹⁾ | 20 ⁽¹⁾ 15 ⁽¹⁾ | | | ⁽¹⁾ Installations which demonstrate to the competent authority that the average organic solvent content of all cleaning material used does not exceed 30 % by weight are exempt from application of these values. |
| 6 | Vehicle coating (< 15) and vehicle refinishing | > 0,5 | 50 ⁽¹⁾ | 25 | | | ⁽¹⁾ Compliance in accordance with point 2 of Part 8 shall be demonstrated based on 15 minute average measurements. |
| 7 | Coil coating (> 25) | | 50 ⁽¹⁾ | 5 | 10 | | ⁽¹⁾ For installations which use techniques which allow reuse of recovered solvents, the emission |

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| | | | | | | | limit value shall be 150. |
| 8 | Other coating, including metal, plastic, textile ⁽⁵⁾ , fabric, film and paper coating (> 5) | 5—15 > 15 | 100 ⁽¹⁾ ⁽⁴⁾ 50/75 ⁽²⁾ ⁽³⁾ ⁽⁴⁾ | 25 ⁽⁴⁾ 20 ⁽⁴⁾ | | | <p>⁽¹⁾ Emission limit value applies to coating application and drying processes operated under contained conditions.</p> <p>⁽²⁾ The first emission limit value applies to drying processes, the second to coating application processes.</p> <p>⁽³⁾ For textile coating installations which use techniques which allow reuse of recovered solvents, the emission limit value applied</p> |

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| | | | | | | |
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| | | | | | | to coating application and drying processes taken together shall be 150. (⁴) Coating activities which cannot be carried out under contained conditions (such as shipbuilding, aircraft painting) may be exempted from these values, in accordance with Article 59(3). (⁵) Rotary screen printing on textile is covered by activity No 3. |
| 9 | Winding wire coating (> 5) | | | | 10 g/kg (¹) 5 g/kg (²) | (¹) Applies for installations where average diameter |

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| | | | | | | of wire ≤ 0,1 mm. (²) Applies for all other installations. |
| 10 | Coating of wooden surfaces (> 15) | 15—25 > 25 | 100 (¹) 50/75 (²) | 25 20 | | (¹) Emission limit value applies to coating application and drying processes operated under contained conditions. (²) The first value applies to drying processes, the second to coating application processes. |
| 11 | Dry cleaning | | | | 20 g/kg (¹) (²) | (¹) Expressed in mass of solvent emitted per kilogram of product cleaned and dried. (²) The emission limit |

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| | | | | | | value in point 2 of Part 4 does not apply for this activity. |
| 12 | Wood impregnation (> 25) | | 100 ⁽¹⁾ | 45 | 11 kg/m ³ | ⁽¹⁾ Emission limit value does not apply for impregnation with creosote. |
| 13 | Coating of leather (> 10) | 10—25 > 25 > 10 ⁽¹⁾ | | | 85 g/m ² 75 g/m ² 150 g/m ² | Emission limit values are expressed in grams of solvent emitted per m ² of product produced. ⁽¹⁾ For leather coating activities in furnishing and particular leather goods used as small consumer goods like bags, belts, wallets, etc. |
| 14 | Footwear manufacture | | | | 25 g per pair | Total emission |

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| | | | | | | |
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| | (> 5) | | | | | limit value is expressed in grams of solvent emitted per pair of complete footwear produced. |
| 15 | Wood and plastic lamination (> 5) | | | | 30 g/m ² | |
| 16 | Adhesive coating (> 5) | 5—15 > 15 | 50 ⁽¹⁾ 50 ⁽¹⁾ | 25 20 | | ⁽¹⁾ If techniques are used which allow reuse of recovered solvent, the emission limit value in waste gases shall be 150. |
| 17 | Manufacture of coating mixture, varnishes, inks and adhesives (> 100) | 100—1 000 > 1 000 | 150 150 | 5 3 | 5 % of solvent input 3 % of solvent input | The fugitive emission limit value does not include solvent sold as part of a coatings mixture in a sealed container. |
| 18 | Rubber conversion | | 20 ⁽¹⁾ | 25 ⁽²⁾ | 25 % of solvent input | ⁽¹⁾ If techniques |

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| | (> 15) | | | | are used which allow reuse of recovered solvent, the emission limit value in waste gases shall be 150. (²) The fugitive emission limit value does not include solvent sold as part of products or mixtures in a sealed container. |
| 19 | Vegetable oil and animal fat extraction and vegetable oil refining activities (> 10) | | | Animal fat: 1,5 kg/tonne Castor: 3 kg/tonne Rape seed: 1 kg/tonne Sunflower seed: 1 kg/tonne Soya beans (normal crush): 0,8 kg/tonne Soya beans (white flakes): 1,2 kg/tonne Other seeds and other vegetable matter: 3 kg/tonne (¹) 1,5 kg/tonne (²) 4 kg/tonne (³) | (¹) Total emission limit values for installations processing individual batches of seeds and other vegetable matter should be set by the competent authority on a case-by-case |

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| | | | | | | | | |
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| | | | | | | | | <p>basis, applying the best available techniques.</p> <p>⁽²⁾ Applies to all fractionation processes excluding de-gumming (the removal of gums from the oil).</p> <p>⁽³⁾ Applies to de-gumming.</p> |
| 20 | Manufacturing of pharmaceutical products (> 50) | 20 ⁽¹⁾ | 5 ⁽²⁾ | 15 ⁽²⁾ | 5 % of solvent input | 15 % of solvent input | <p>⁽¹⁾ If techniques are used which allow reuse of recovered solvent, the emission limit value in waste gases shall be 150.</p> <p>⁽²⁾ The fugitive emission limit value does not include solvent sold as part of products or mixtures</p> | |

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in a sealed container.

PART 3

Emission limit values for installations of the vehicle coating industry

- The total emission limit values are expressed in terms of grams of organic solvent emitted in relation to the surface area of product in square metres and in kilograms of organic solvent emitted in relation to the car body.
- The surface area of any product dealt with in the table under point 3 is defined as the surface area calculated from the total electrophoretic coating area, and the surface area of any parts that might be added in successive phases of the coating process which are coated with the same coatings as those used for the product in question, or the total surface area of the product coated in the installation.

The surface of the electrophoretic coating area is calculated using the following formula:

$$\frac{2 \times \text{total weight of product shell}}{\text{average thickness of metal sheet} \times \text{density of metal sheet}}$$

This method shall also be applied for other coated parts made out of sheets.

Computer aided design or other equivalent methods shall be used to calculate the surface area of the other parts added, or the total surface area coated in the installation.

- The total emission limit values in the table below refer to all process stages carried out at the same installation from electrophoretic coating, or any other kind of coating process, through to the final wax and polish of topcoating inclusive, as well as solvent used in cleaning of process equipment, including spray booths and other fixed equipment, both during and outside of production time.

| Activity(solvent consumption threshold in tonnes/year) | Production threshold(refers to annual production of coated item) | Total emission limit value | |
|--|--|--|--|
| | | New installations | Existing installations |
| Coating of new cars (> 15) | > 5 000 | 45 g/m ² or 1,3 kg/body + 33 g/m ² | 60 g/m ² or 1,9 kg/body + 41 g/m ² |
| | ≤ 5 000 monocoque or > 3 500 chassis-built | 90 g/m ² or 1,5 kg/body + 70 g/m ² | 90 g/m ² or 1,5 kg/body + 70 g/m ² |
| | | Total emission limit value (g/m ²) | |
| Coating of new truck cabins (> 15) | ≤ 5 000 | 65 | 85 |
| | > 5 000 | 55 | 75 |
| Coating of new vans and trucks (> 15) | ≤ 2 500 | 90 | 120 |
| | > 2 500 | 70 | 90 |
| Coating of new buses (> 15) | ≤ 2 000 | 210 | 290 |

| | | |
|---------|-----|-----|
| > 2 000 | 150 | 225 |
|---------|-----|-----|

4. Vehicle coating installations below the solvent consumption thresholds mentioned in the table under point 3 shall meet the requirements for the vehicle refinishing sector set out in Part 2.

PART 4

Emission limit values relating to volatile organic compounds with specific risk phrases

1. For emissions of the volatile organic compounds referred to in Article 58 where the mass flow of the sum of the compounds causing the labelling referred to in that Article is greater than, or equal to, 10 g/h, an emission limit value of 2 mg/Nm³ shall be complied with. The emission limit value refers to the mass sum of the individual compounds.
2. For emissions of halogenated volatile organic compounds which are assigned or need to carry the hazard statements H341 or H351, where the mass flow of the sum of the compounds causing the hazard statements H341 or H351 is greater than, or equal to, 100 g/h, an emission limit value of 20 mg/Nm³ shall be complied with. The emission limit value refers to the mass sum of the individual compounds.

PART 5

Reduction scheme

1. The operator may use any reduction scheme, specially designed for his installation.
2. In the case of applying coatings, varnishes, adhesives or inks, the following scheme can be used. Where the following method is inappropriate, the competent authority may allow an operator to apply any alternative scheme achieving equivalent emission reductions to those achieved if the emission limit values of Parts 2 and 3 were to be applied. The design of the scheme shall take into account the following facts:
 - (a) where substitutes containing little or no solvent are still under development, a time extension shall be given to the operator to implement his emission reduction plans;
 - (b) the reference point for emission reductions should correspond as closely as possible to the emissions which would have resulted had no reduction action been taken.
3. The following scheme shall operate for installations for which a constant solid content of product can be assumed:
 - (a) The annual reference emission is calculated as follows:
 - (i) The total mass of solids in the quantity of coating and/or ink, varnish or adhesive consumed in a year is determined. Solids are all materials in coatings, inks, varnishes and adhesives that become solid once the water or the volatile organic compounds are evaporated.
 - (ii) The annual reference emissions are calculated by multiplying the mass determined in (i) by the appropriate factor listed in the table below.

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Competent authorities may adjust these factors for individual installations to reflect documented increased efficiency in the use of solids.

| Activity | Multiplication factor for use in item (a)(ii) |
|---|--|
| Rotogravure printing; flexography printing; laminating as part of a printing activity; varnishing as part of a printing activity; wood coating; coating of textiles, fabric film or paper; adhesive coating | 4 |
| Coil coating, vehicle refinishing | 3 |
| Food contact coating, aerospace coatings | 2,33 |
| Other coatings and rotary screen printing | 1,5 |

- (b) The target emission is equal to the annual reference emission multiplied by a percentage equal to:
- (i) (the fugitive emission limit value + 15), for installations falling within item 6 and the lower threshold band of items 8 and 10 of Part 2,
 - (ii) (the fugitive emission limit value + 5) for all other installations.
- (c) Compliance is achieved if the actual solvent emission determined from the solvent management plan is less than or equal to the target emission.

PART 6

Emission monitoring

1. Channels to which abatement equipment is connected, and which at the final point of discharge emit more than an average of 10 kg/h of total organic carbon, shall be monitored continuously for compliance.
2. In the other cases, Member States shall ensure that either continuous or periodic measurements are carried out. For periodic measurements at least three measurement values shall be obtained during each measurement exercise.
3. Measurements are not required in the case where end-of-pipe abatement equipment is not needed to comply with this Directive.

PART 7

Solvent management plan

1. Principles

The solvent management plan shall be used to:

- (a) verify compliance as specified in Article 62;
- (b) identify future reduction options;

- (c) enable provision of information on solvent consumption, solvent emissions and compliance with the requirements of Chapter V to the public.

2. Definitions

The following definitions provide a framework for the mass balance exercise.

Inputs of organic solvents (I):

- I1 The quantity of organic solvents or their quantity in mixtures purchased which are used as input into the process in the time frame over which the mass balance is being calculated.
- I2 The quantity of organic solvents or their quantity in mixtures recovered and reused as solvent input into the process. The recycled solvent is counted every time it is used to carry out the activity.

Outputs of organic solvents (O):

- O1 Emissions in waste gases.
- O2 Organic solvents lost in water, taking into account waste water treatment when calculating O5.
- O3 The quantity of organic solvents which remains as contamination or residue in products output from the process.
- O4 Uncaptured emissions of organic solvents into air. This includes the general ventilation of rooms, where air is released to the outside environment via windows, doors, vents and similar openings.
- O5 Organic solvents and/or organic compounds lost due to chemical or physical reactions (including those which are destroyed, by incineration or other waste gas or waste water treatments, or captured, as long as they are not counted under O6, O7 or O8).
- O6 Organic solvents contained in collected waste.
- O7 Organic solvents, or organic solvents contained in mixtures, which are sold or are intended to be sold as a commercially valuable product.
- O8 Organic solvents contained in mixtures recovered for reuse but not as input into the process, as long as not counted under O7.
- O9 Organic solvents released in other ways.

3. Use of the solvent management plan for verification of compliance.

The use made of the solvent management plan shall be determined by the particular requirement which is to be verified, as follows:

- (a) verification of compliance with the reduction scheme as set out in Part 5, with a total emission limit value expressed in solvent emissions per unit product, or otherwise stated in Parts 2 and 3.
- (i) for all activities using the reduction scheme as set out in Part 5, the solvent management plan shall be drawn up annually to determine the consumption (C). The consumption shall be calculated according to the following equation:

$$C = I1 - O8$$

A parallel exercise shall also be undertaken to determine solids used in coating in order to derive the annual reference emission and the target emission each year.

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- (ii) for assessing compliance with a total emission limit value expressed in solvent emissions per unit product or otherwise stated in Parts 2 and 3, the solvent management plan shall be drawn up annually to determine the emissions (E). The emissions shall be calculated according to the following equation:

$$E = F + O1$$

Where F is the fugitive emission as defined in point (b)(i). The emission figure shall then be divided by the relevant product parameter.

- (iii) for assessing compliance with the requirements of point (b)(ii) of Article 59(6), the solvent management plan shall be drawn up annually to determine total emissions from all activities concerned, and that figure shall then be compared with the total emissions that would have resulted had the requirements of Parts 2, 3 and 5 been met for each activity separately.

- (b) Determination of fugitive emissions for comparison with the fugitive emission limit values in Part 2:

- (i) The fugitive emission shall be calculated according to one of the following equations;

$$F = I1 - O1 - O5 - O6 - O7 - O8$$

or

$$F = O2 + O3 + O4 + O9$$

F shall be determined either by direct measurement of the quantities or by an equivalent method or calculation, for instance by using the capture efficiency of the process.

The fugitive emission limit value is expressed as a proportion of the input, which shall be calculated according to the following equation:

$$I = I1 + I2$$

- (ii) Determination of fugitive emissions shall be done by a short but comprehensive set of measurements and needs not be done again until the equipment is modified.

PART 8

Assessment of compliance with emission limit values in waste gases

1. In the case of continuous measurements the emission limit values shall be considered to be complied with if:
 - (a) none of the arithmetic averages of all valid readings taken during any 24-hour period of operation of an installation or activity except start-up and shut-down operations and maintenance of equipment exceeds the emission limit values,
 - (b) none of the hourly averages exceeds the emission limit values by more than a factor of 1,5.

2. In the case of periodic measurements the emission limit values shall be considered to be complied with if, in one monitoring exercise:
 - (a) the average of all the measurement values does not exceed the emission limit values,
 - (b) none of the hourly averages exceeds the emission limit value by more than a factor of 1,5.
3. Compliance with Part 4 shall be verified on the basis of the sum of the mass concentrations of the individual volatile organic compounds concerned. For all other cases, compliance shall be verified on the basis of the total mass of organic carbon emitted unless otherwise specified in Part 2.
4. Gas volumes may be added to the waste gas for cooling or dilution purposes where technically justified but shall not be considered when determining the mass concentration of the pollutant in the waste gas.

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- (1) [OJ L 263, 9.10.2007, p. 1.](#)